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REPORT ON RE-EXAMINATION OF TRAP TREES OF 1925

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October 29, 1926

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RE-EXAMINATION OF TRAP TREES OF 1925

Very soon after reaching the Kaibab June 7, a re-examination was made of most of the trap trees of 1925 to determine several points of interest. Chief among these objects was to determine the success of the attacks during the summer of 1925 of D. valens on the trees of different types of treatment; to get some idea of the survival and condition of the brood of D. valens, D. ponderosae, D. approximatus and D. convexifrons, and to spot any late fall or early spring attacks of these barkbeetles upon the trap trees.

A number of the stumps of felled trap trees were peeled of all bark not only above ground but also for some distance under the soil, and burrows of D. valens on the standing trap trees were opened and examined to determine success of attack and survival of brood. Beetle-logs of the felled trap trees were also peeled to get data on the survival of D. approximatus and ponderosae.

BELT GIRDLED TREES.

B.A 1 of 4/30/25 (Re-examined June 9, 1925).

During the summer of 1925 five attacks of D. valens was recorded. Of these three were abortive, the parents beetles never having established themselves and the other two were failures in that the brood had not become established.

B.A. 2 - 4/30/25 - (Re-examined June 9, 1926)

This showed no attack either in 1925 or 1926

B.A. 3 - 5/1/25 - (Re-examined June 9, 1926)

During the summer of 1925, 3 attacks of D. valens below girdle were recorded. Examination showed all were failures - the adults having been drownded in the pitch after burrows had been extended 2-6 inches.

B.A. 1 - 6/29/25 - (Examined June 9, 1926)

Four attacks were recorded below girdle during 1925. Two fresh attacks of the Spring of 1926 were also found. The old attacks were all failures. The new burrows were only extended 1-3 inches and as yet could not be classed as successful.

B.A. 2 - 6/29/25 (Re-examined June 9, 1926)

This tree had suffered 9 attacks of D. valens below the girdle up to July 28, 1925, after which it was heavily attacked and killed by D. ponderosae. The re-examination showed a considerable survival of the brood of D. valens. Some young adults were still in the bark and many had already emerged. New attacks by Ips integer and Hylurgops subcostulatus were also evident.

B.A. 3 - 6/29/25 (Re-examined June 9, 1926)

Ten attacks recorded for 1925. All of these failures so far as producing brood is concerned. Several new (1926) attacks - some with very pitchy pitchtubes, others with pitchy sawdust. The latter may prove successful.

B.A. 4 - 6/29/25 (Re-examined June 9, 1926)

Five attacks recorded for 1925. No living brood.

The Belt girdled trees of July 29, 1926, showed no attack of D. valens or other barkbeetles either in 1925 or up to June 9, 1926.

HACK-GIRDLED TRAP-TREES OF 1925.

B.b - 1 - 4/30/25 (Re-examined June 9, 1926)

No attack by D. valens or other bark beetles either in 1925 or up to June 9, 1926.

B.b. -2 - 4/30/25 (Re-examined June 9, 1926)

This tree was broken off by the wind during the first week of June 1925 and thereafter its later history was similar to that of a felled trap-tree. The attack of D. valens on the stump during 1925 had made good and the young adults had emerged by June 9, 1926.

B.b. - 4 - 5/1/25 (Re-examined June 9, 1925)

Four attacks recorded for 1925. These were opened August 25, 1925 and found to be unsuccessful.

B.b. - 1 - 5/29/25 (Re-examined June 9, 1926.)

This tree suffered 5 attacks by D. valens before June 29. It was later attacked and killed by D. ponderosae. At some time during the early spring of 1926 it was struck by lightning. On re-examination June 9 it was found that the D. valens attacks had all failed. The beetles, still more or less green, had been filled in (during late fall and early spring) with Ips integer, D. convexifrons, etc.

B.b. - 2 5/29/25 (Re-examined June 9, 1926)

Five attack by D. valens during summer of 1925. None successful.

B.b.- 1.- 6/29/25 (Re-examined June 9, 1926)

Seven attacks during 1925. Tree blown down during winter. Old attacks were failures. New attacks show only sawdust.

B.b. - 2 - 6/29/25 (Re-examined June 9, 1926)

This tree after being attacked 5 times by D. valens was filled in and killed by D. ponderosae. Re-examination showed that D. valens had successfully reared its brood. Considerable emergence had already occurred and some young beetles were still under bark.

B.b. - 3 - 6/29/25 (Re-examined June 9, 1925)

Five attacks recorded for 1925. All of these failed to produce brood. Most of parent beetles dead in the pitch.

B.b. - 4 - 6/29/25 (Re-examined June 9, 1926)

Eight attacks during 1925 - all failures. A few new attacks of 1926 may or may not make good.

The hack-girdled trees of 7/29/25 showed no attacks either of 1925 or 1926 up to June 10.

FELLED TRAP-TREES OF 1925.

B.C. - 1 - 4/30/25 (Re-examined June 9, 1926)

The stump suffered heavy attacks by D. valens during 1925. Examination in August showed considerable brood present. Re-examination June 9, 1926, showed bark riddled by brood of D. valens and Hylurgops. Heavy emergence of D. valens.

B.C. - 2 - 4/30/25 (Re-examined June 9, 1926)

Conditions similar to B. C - 1 above. All young adults out.

B.C. - 3 - 5/1/25 (Re-examined June 9, 1926)

Many attacks of 1925 but little evidence of brood and only one larva found (K-144).

Butt log showed no survival of a rather heavy D. approximatus attack. Considerable Hylastes sp. (K-145).

B.C. - 4 - 5/1/25 - (Re-examined June 9, 1926)

Stump shows considerable evidence of brood work of D. valens. Moderately numerous emergence, emergence holes filled with brown bark-frass. One adult taken in emergence hole (K-146)

B.C. - 1 - 5/29/25 (Re-examined June 9, 1926)

D. valens made good and reared brood in stump and D. approximatus in butt-log.

B-C - 2 5/29/25 (Re-examined June 9, 1926)

Moderate emergence of D. valens from stump.

Butt-log full of Cerambycids - destroying burrows of D. approximatus.

B.C. - 1 - 6/29/25 (Re-examined June 9, 1926)

Stumps show a mixture of old and new attacks of D. valens. Some emergence had taken place and considerable number of young adults taken in exit galleries. Brood not heavy as compared to that in white pine stumps in the east. New attacks are in strips of bark still green.

Butt-log showed light attacks by D. ponderosae and D. approximatus. Little or no survival of brood. Considerable Hylastes sp.

B.C. - 2 - 6/29/25 - (Re-examined June 9, 1926)

Stump shows attacks of D. valens, ponderosae and approximatus. Fair survival of D. valens brood. Considerable emergence. No survival of approximatus or ponderosae observed.

B.C.- 3 - 6/29/25 (Re-examined June 9, 1926)

D. valens attacks mostly failures. No brood in stump. Butt-log - a few attacks by D. approximatus and ponderosae. Light survival of brood of former and no survival of latter.

B.C. - 4 - 6/29/25 (Re-examined June 9, 1926)

The stump showed considerable successful attacks - many young adults and a few overwintered parent adults. Butt-log showed a weak survival of D. approximatus brood.

B.C. - 1 - 7/29/25 (Re-examined June 9, 1926)

The butt-log of this trap-tree was attacked by D. ponderosae two days after felling and later suffered numerous attacks. Re-examination June 9, 1926, showed a moderate attack of D. ponderosae (Cf. B.C.-3 of even date) but no living brood. There was a considerable survival of overwintered adults.

B.C. - 2 - 7/29/25 (Re-examined June 9, 1926)

In this trap-tree the cut out butt-log was covered with brush at the time of preparation. The butt-log showed a moderate attack by D. ponderosae (lighter than in B.C. 1) a heavy survival of overwintered parent adults, but no brood. Trunk above the butt-log (not covered with bark) showed a lighter attack and a scanty surviving brood on south side, 30 feet from stump.

The stump showed many fresh attacks - apparently making good and a few old attacks of 1925 which failed.

B.C. - 3 - 7/29/25 (Re-examined June 9, and 15, 1926)

Stump showed a few attacks of D. valens which were successful. Burrows contained overwintered parent adults and a group of 9 young adults ready to emerge. Also several new attacks of 1926.

The butt-log showed a rather heavy attack of D. ponderosae with a considerable survival of overwintered parent adults. The brood, however, was all dead - some of the larval galleries being about 2" long, others very short and many egg-galleries showing the egg-niches but no larval mines. This would indicate a condition in the log which brought about an early mortality of the larvae and in some cases seemed to prevent the egg from hatching.

Average attacks on butt-log 4.1 per sq. ft. - total attacks 2.23 In 2nd log (not cut out) attacks were 83 an average of 1.88 per sq. ft. and there was a considerable survival of the brood.

B.C. - 4 - 7/29/25 (Re-examined June 9 and 15, 1926)

The stump showed no old attacks of D. valens but a few new attacks both of this sp. and of Hylurgops.

The butt-log which in this tree was covered with brush, showed the inner bark still green for the most part. There was a total of 27 attacks on the butt - log, nearly all of which were on the under side. No living brood was found except from one burrow underneath where 10 living larvae were seen. Many of the attacks had been failures.

CONCLUSIONS.

A few tentative conclusions may be drawn from the data given above.

First, as regards D. valens. - This species seems to be in flight at all times from the latter part of May until early August. It will attack either normal standing trees, standing trap-trees, stumps or logs where ever the odor of pitch attracts it. Stumps are most attractive and will be attacked as long as the inner bark is not discolored. Its attacks are usually successful on stumps although the amount of brood produced in yellow pine stumps is apparently not comparable to that surviving in white pine in the East. In normal trees and in belt-girdled and hack-girdled trap-trees the attacks are not successful unless the tree is blown down or killed by the activities of barkbeetles or other agencies before the attacking valens is pitched out. Where this happens the adults establish themselves and the brood comes through in about the same ratio as in stumps.

D. approximatus attacks the butt-logs of felled trap-trees very readily. However, in such material it is in strong competition with Ips, Hylurgops and several species of round-headed borers resulting in a high mortality of the brood. The favorite and also most favorable breeding place for this species is in the lower trunks of trees killed by the Black Hills Beetle - especially on the north side of the trunk.

D. ponderosae readily attacks felled trap-trees if they are in suitable fresh condition at the time of flight. The uncovered felled trees with the butt-log cut out, prepared the 29th of July were attacked nearly as heavily as standing trees. However, these trees while they were attractive to the adults provided conditions very unfavorable for the brood which suffered a total mortality in the butt-logs while the brood in the second log (not cut out) was below normal. In such butt-logs many of the eggs either did not hatch or the larvae died immediately. Of those which did not perish at once, a few lived long enough to construct larval mines about two inches long. This would indicate an early mortality of the larvae, during the fall succeeding attack. It is probably brought about by a souring of the sap or at any rate the production of a condition similar to that in the S - series of experiments.

In two of the trees the butt-log was covered with brush at the time of felling. The presence of the brush acted as a detirrent to attack by the Black Hills Beetle. Most of the attacks were unsuccessful but the few larvae which were produced did not suffer such a complete mortality. Attacks above the butt-log were more numerous than in the portion covered by brush and here there was a considerable survival of the brood in both types of felled trap trees.